

What is claimed is:

- 1 1. A method of producing a biotin vitamer by:
2 (a) culturing a bacterium comprising a lysine-
3 utilizing DAPA aminotransferase, said culturing taking place
4 in an environment enriched for lysine, a lysine analog, or a
5 lysine precursor; and
6 (b) recovering said biotin vitamer.
- 1 2. A method of producing a biotin vitamer by:
2 (a) culturing a bacterium comprising a lysine-
3 utilizing DAPA aminotransferase, wherein said bacterium is
4 deregulated with respect to lysine production; and
5 (b) recovering said biotin vitamer.
- 1 3. The method of claim 1 in which the bacterium is
2 engineered to overproduce a lysine-utilizing DAPA
3 aminotransferase.
- 1 4. The method of claim 2 in which the bacterium is
2 engineered to overproduce a lysine-utilizing DAPA
3 aminotransferase.
- 1 5. The method of claim 2 or claim 4, wherein
2 lysine, a lysine analog, or a lysine precursor is
3 exogenously added to the culture.
- 1 6. The method of ~~claim 1~~, claim 2, ~~claim 3~~, or
2 claim 4, in which lysine, a lysine analog, or a lysine
3 precursor is exogenously added to the culture and totals at
4 least 10 mmoles per liter of culture.

1 7. The method of claim 1, claim 2, claim 3, or
2 claim 4, in which the biotin vitamer is biotin,
3 dethiobiotin, or diaminopelargonic acid (DAPA).

1 8. The method of claim 1, claim 2, claim 3, or
2 claim 4, in which the biotin vitamer is dethiobiotin, and,
3 after recovering the dethiobiotin, the method further
4 comprises converting the recovered dethiobiotin to biotin by
5 a separate fermentation, biochemical reaction, or chemical
6 reaction, and recovering biotin.

1 9. The method of claim 1, claim 2, claim 3, or
2 claim 4, in which the bacterium is resistant to a lysine
3 analog.

1 10. The method of claim 9, wherein said analog is
2 S-2-aminoethyl-L-cysteine (AEC).

1 ~~sub A47~~ 11. The method of claim 1 or claim 2, in which the
2 bacterium is deregulated with respect to at least one biotin
3 synthetic pathway step in addition to *bioA* expression.

1 12. The method of claim 1, claim 2, claim 3, or
2 claim 4, in which the biotin vitamer is biotin, and the
3 method comprises recovering and purifying the biotin.

1 ~~sub A57~~ 13. The method of claim 1, claim 2, claim 3, or
2 claim 4, wherein said bacterium is further engineered to
3 produce a SAM-utilizing DAPA aminotransferase.

1 14. The method of claim 13 in which methionine, S-
2 adenosylmethionine (SAM), or an analog of SAM is added to
3 the culture.

1 15. The method of claim 13 wherein lysine, a lysine
2 analog, or a lysine precursor is added to the culture.

1 16. The method of claim 14, wherein lysine, a
2 lysine analog, or a lysine precursor is added to the
3 culture.

1 ~~sub A7~~ 17. ~~The method of claim 15 in which lysine or a~~
2 ~~lysine analog exogenously added to the culture totals at~~
3 ~~least 10 mmoles per liter of culture.~~

1 18. The method of claim 16 in which lysine or a
2 lysine analog exogenously added to the culture totals at
3 least 10 mmoles per liter of culture.

1 19. The method of claim 13 in which the biotin
2 vitamer is biotin, dethiobiotin, or diaminopelargonic acid
3 (DAPA).

1 20. The method of claim 13 in which the biotin
2 vitamer is dethiobiotin, and, after recovering the
3 dethiobiotin, the method further comprises converting the
4 recovered dethiobiotin to biotin by a separate fermentation,
5 biochemical reaction, or chemical reaction, and recovering
6 biotin.

1 ~~sub A7~~ 21. ~~The method of claim 13 in which the bacterium~~
2 ~~is deregulated with respect to at least one biotin synthetic~~
3 ~~pathway step other than bioA expression.~~

1 22. The method of claim 13 in which the biotin
2 vitamer is biotin, and the method comprises recovering and
3 purifying the biotin.

1 23. A bacterium engineered to overproduce a lysine-
2 utilizing DAPA aminotransferase and a SAM-utilizing DAPA
3 aminotransferase.

1 24. The bacterial strains BI90 (ATCC ____) and BI96
2 (ATCC ____).

1 25. The bacterium of claim 23, wherein the strain
2 is further engineered to overproduce the biotin vitamer by
3 engineered deregulation of at least one biotin synthetic
4 step, in addition to *bioA* expression.

1 26. The bacterial strain BI603 (ATCC ____).

1 27. A bacterium engineered to overproduce a lysine-
2 utilizing DAPA aminotransferase, wherein the bacterium is
3 further engineered to overproduce lysine.

1 28. The bacterial strain BI641 (ATCC ____) or BI642
2 (ATCC ____).

1 29. A biotin vitamer manufactured by the method of
2 claim 1, claim 2, claim 3, or claim 4.

1 30. A biotin vitamer manufactured by the method of
2 claim 13.

1 31. A biotin vitamer manufactured by the method of
2 claim 14.